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1. Introduction

- Advanced Scatterometer (ASCAT) on-board Metop a,b:
 - Operating at C-band (5.2 GHz)
 - Measures the backscatter power related to the surface roughness -> wind vector
 - Sensitive at high wind speeds
 - Prone to attenuation effects under precipitation
- ❖ Approximately 45 minutes time interval between ASCAT a, b -> Unique opportunity to explore the evolution of maritime convection.
- Next Generation Radars (NEXRAD):
 - Coastal network over the US continent
 - Operating at S-band (10 cm)
 - Not heavily affected by precipitation
 - Dual polarization capabilities (Z_{dr} , K_{dp} , etc.)
 - Improved rainfall rate estimation
 - Well-developed hydrometeor algorithms (HID) for S-band
 - Single-Doppler retrieval of the wind field
- ❖ Polarimetric algorithm's products include the liquid water and ice mass, HID, and the median volume diameter (D0)

2. Motivation

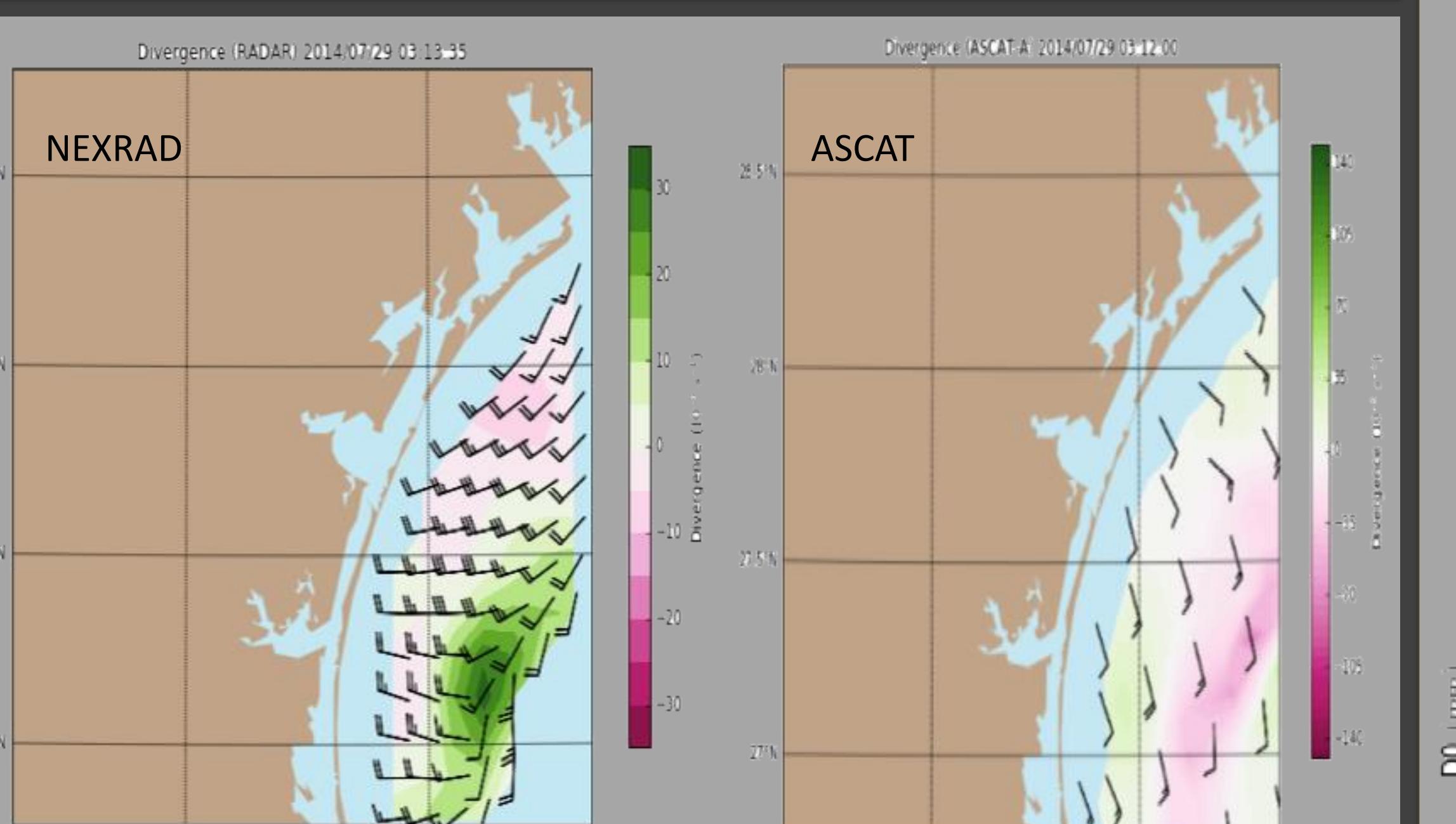
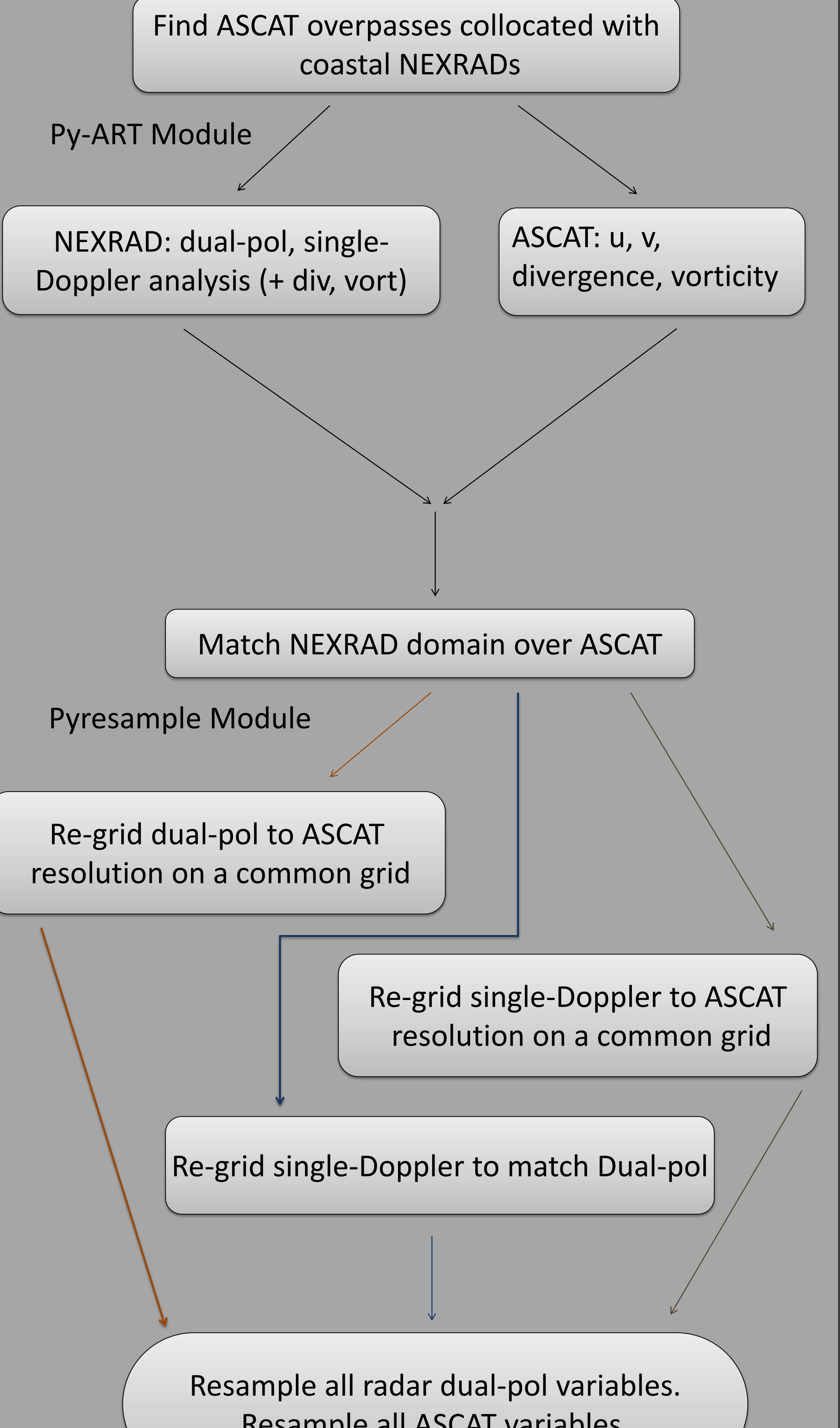
Leveraging the constellation of space- and ground-based instrumentation we seek to better explore the characteristics of maritime storms.

- Which radar-observed characteristics indicate strong maritime convection?
- How are the radar-derived mass estimates related to the ASCAT winds?

5. Discussion

- High reflectivity is correlated with high winds and high liquid water content.
- Divergence aloft, as captured by the radar, and convergence near the surface, as depicted by ASCAT, denote an updraft in the southeast region of the convective system. Within a diameter of ~20 km around this region is where the highest winds and most of the variability occurred.
- Over the same region, a “ Z_{dr} column” associated with a correlation coefficient minimum (~0.9) further support the presence of an updraft.
- The buoy measured high winds (17.3 m/s) from 43°, 20 minutes after the overpass of the scatterometer, but in accordance with the ASCAT wind speed (17.43 m/s) and direction (80.3°).
- The wind speed measured by ASCAT reveals an increasing relationship with the median volume diameter. Is this indicative of potential C-band resonance effects?
- The effect of the integrated water mass on the wind measurement is more robust at higher wind speeds and for mass greater than 5 kg/m³ for this case study. How do the LWP and the D0 affect the ASCAT wind measurements?
- ASCAT Quality Control Flags also indicate the presence of rain over the domain, and more specifically coincident with the high LWC region.
- Other cases of strong oceanic convection exhibit similar characteristics, demonstrating utility of combining ground polarimetric radar and scatterometer.

3. Methodology



6. Acknowledgements

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4. Case Study

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